

IN THE CLAIMS:

We claim:

1 1. A hybrid substrate comprising:
2 a substrate having a plurality of pockets patterned thereon; and
3 at least two different materials provided within a respective pocket of the plurality of
4 pockets.

1 2. The hybrid substrate according to Claim 1, wherein the at least two different
2 materials are approximately co-planar with a top surface of the substrate.

1 3. The hybrid substrate according to Claim 1, wherein the at least two different
2 materials are bonded to the substrate.

1 4. The hybrid substrate according to Claim 1, wherein each of the at least two
2 different materials is selected from the group consisting of GaAs, InP, silicon wafer, GaN-
3 based high-electron mobility transistors (HEMTs), and optoelectronic devices.

1 5. The hybrid substrate according to Claim 1, wherein the substrate is selected
2 from the group consisting of AlN, quartz, glass, ceramic, CVD diamond, and sapphire.

1 6. The hybrid substrate according to Claim 1, wherein the substrate is a high
2 thermal conductive substrate.

1 7. The hybrid substrate according to Claim 1, wherein each of the plurality of
2 pockets has a greater surface area than a cross-section surface area of the at least two
3 different materials.

1 8. A method for fabricating a hybrid substrate comprising the steps of:
2 patterning a substrate with a plurality of pockets; and
3 providing a material within each of the plurality of pockets, wherein at least two
4 materials provided within two respective pockets of the plurality of pockets are different.

1 9. The method according to Claim 8, further comprising the step of planarizing
2 the materials provided within each of the plurality of pockets, such that a top surface of the
3 materials is approximately co-planar with a top surface of the substrate.

1 10. The method according to Claim 9, wherein the planarizing step includes a
2 chem-mech polishing step.

1 11. The method according to Claim 8, further comprising the step of providing a
2 thermal conductivity layer between the substrate and the material provided within each of the
3 plurality of pockets.

1 12. The method according to Claim 10, wherein the thermal conductivity layer is
2 a CVD diamond layer.

1 13. The method according to Claim 8, further comprising the step of providing a
2 layer of oxide over the material provided within each of the plurality of pockets.

1 14. The method according to Claim 13, wherein the layer of oxide is a layer of
2 CVD oxide.

1 15. The method according to Claim 8, further comprising the step of providing an
2 oxide on at least one surface of each material before the step of providing the material within
3 each of the plurality of pockets.

1 16. The method according to Claim 8, further comprising the step of annealing to
2 adhere the material provided within each of the plurality of pockets to the substrate.

1 17. The method according to Claim 8, further comprising the step of preparing the
2 material provided within each of the plurality of pockets with the blister separation method.

1 18. The method according to Claim 8, further comprising the step of applying
2 interconnect structures between the materials provided within the plurality of pockets.

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